MASTER OF SCIENCE
IN
DEFENSE ANALYSIS

AN AD HOC WIRELESS MOBILE COMMUNICATIONS MODEL FOR SPECIAL OPERATIONS FORCES

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The digitization of the battlefield enables special operators to use improved communications supported by computer networks across a range of missions. The communications paradigm is evolving toward mobile wireless ad hoc networks. This development enables an autonomous system of mobile nodes supporting peer-to-peer communications in forward-deployed military networks. Ad hoc networks have to establish a reliable, secure, instant, and usually temporary, communication infrastructure and to be able to access in a global communications infrastructure.

Our model describes a global communication network supporting the special operator in mobile wireless communications. The main purpose is to provide a handheld wireless communications node which is capable of transferring voice, data, and imagery to and from parallel and vertical command structures within an environment replete with electronic countermeasures. The model will support the representation of requirements such as throughput, quality of service with low power consumption, and low probability of detection/interception. Special Forces are moving toward using commercial-off-the-shelf products and services based on availability and cost effectiveness.

Using GloMoSim tool, simulations for a direct action scenario are run and the efficiency of on-demand and table-driven routing protocols under different bandwidths and communications loads is compared.

DoD KEY TECHNOLOGY AREA: Computing and Software

KEYWORDS: Special Operation Forces, Ad Hoc, Wireless, Mobile Communications, Information Operations, Electromagnetic Pulse Weapons, EMP

MARITIME IRREGULAR WARFARE: A LONG-RANGE VIEW

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Maritime irregular warfare (MIW) has been around since the dawn of sea power. While conventional naval warfare holds the premier position in naval affairs, MIW constitutes a less understood but equally important "other" tradition that merits closer attention. History demonstrates a link between the evolution of regular naval warfare and its irregular counterpart. When fully understood and correctly utilized, MIW actions have proven extremely effective at providing unconventional solutions to complex military problems. Consistently, MIW forces have powerfully affected the outcomes of conflict both at sea and on

land. Through the skillful employment of MIW, this long historical pattern can continue to affect conflicts of the 21st century.

In an era of rapid change, the ability to clearly identify and understand emerging trends in conflict and military affairs is an essential element in assessing MIW's future. As conventional warfare begins to realign for future threats, practitioners of MIW need to begin thinking proactively about how MIW can stay relevant, and the concerted actions that need to be taken in order to fit into the future of warfare. This thesis is an attempt to take a first glimpse of MIW's future.

DoD KEY TECHNOLOGY AREAS: Surface/Under Surface Vehicles - Ships and Watercraft, Other (Maritime Irregular Warfare)

KEYWORDS: Maritime Irregular Warfare, Information Age Conflict